Drosophila* (*Drosophila*) *serraprocessata sp. nov.
(Figs. 9–13)

♂. Body *ca.* 3.0–3.5 mm in length.

Head: Eye tannish red, with pile. Second joint of antenna yellow, with 3 stout setae; 3rd joint yellowish. Arista with 7 dorsal, 3 or 4 ventral long branches and moderate terminal fork. Palpus yellow, with 1 long stout bristle at tip and a few small hairs. Ocellar triangle yellow, black on inner margins of ocelli, with a few small hairs; ocellars long. Periorbit yellow. Frons yellowish red; periorbit and anterior part of frons shinning silvery-white in lateral view. Clypeus medially yellow, laterally brown. Frons *ca.* 1/2 as broad as head, with a few frontal hairs. Face brownish. Carina high, upper narrow and lower wide. Cheek yellow, brown at base of vibrissa, *ca.* 1/9 as broad as greatest diameter of eye. Posterior reclinate orbital nearer to inner vertical than to proclinate orbital. Anterior reclinate orbital *ca.* 3/7 length of posterior reclinate; proclinate *ca.* 9/10 length of posterior reclinate. Second oral as long as vibrissa.

Thorax: Mesoscutum brownish yellow. Scutellum brownish yellow. Thoracic pleura yellow. Humerals 3; upper one smallest. Acrostichal hairs in 8 rows. Anterior dorsocentral *ca.* 1/2 length of posterior; cross distance of dorsocentrals *ca.* 2.4 length distance. Anterior scutellar as long as posterior. Sterno-index *ca.* 0.7.

Legs yellow. Fore femur with row of *ca.* 11–12 spinules. Preapicals on all tibiae; apicals on mid tibia. ♂ fore tarsus anteriorly with long recurved hairs; proximal 2 tarsal joints with thick hair tuft on inner side. Mid and hind tarsi each with row of minute cuneiform bristles on underside. Fore metatarsus shorter than 2 succeeding tarsal joints together; mid and hind metatarsi as long as rest together.

Wing hyaline. Veins brownish yellow; anterior cross vein clear; posterior cross vein cloud; R_{4+5} and M nearly parallel. C_1-bristles 2, upper one larger. Wing indices: C *ca.* 2.8, 4C *ca.* 0.75, 4V *ca.* 0.65, 5x *ca.* 1.0, Ac *ca.* 2.6, C3F *ca.* 6/7. Haltere yellowish.

Abdomen: Tergites yellow; 2nd to 5th tergites each with narrow, not sharply demarcated, medially interrupted, caudal dark brown band; 6th tergite entirely yellow.

Periphallic organs (Figs. 9 and 10): Epandrium brown and shinning, with 1 bristle at base of surstylus and 2 black stout teeth on toe. Surstylus (Fig. 10) with *ca.* 14 black primary teeth in concave row on entire distal margin. Cercus large, oval, brown, with many long bristles; ventral part paler, with *ca.* 3 short bristles.

Phallic organs (Figs. 11–13): Aedeagus brown, subapically somewhat dilated, dorsomedially with knob; dorsal process membranous, hairy on upper half surface, basally with 1 pair of recurved, thin, bare branches. Hypandrial process with deep incision and serration on apical margin. Novasternum nearly quadrate, with 1 pair of submedian spines near bases of hypandrial processes.

Holotype ♂, China: Meng-long, Meng-la Country, Yunnan Province, 3.X.1985 (W. X. Zhang).

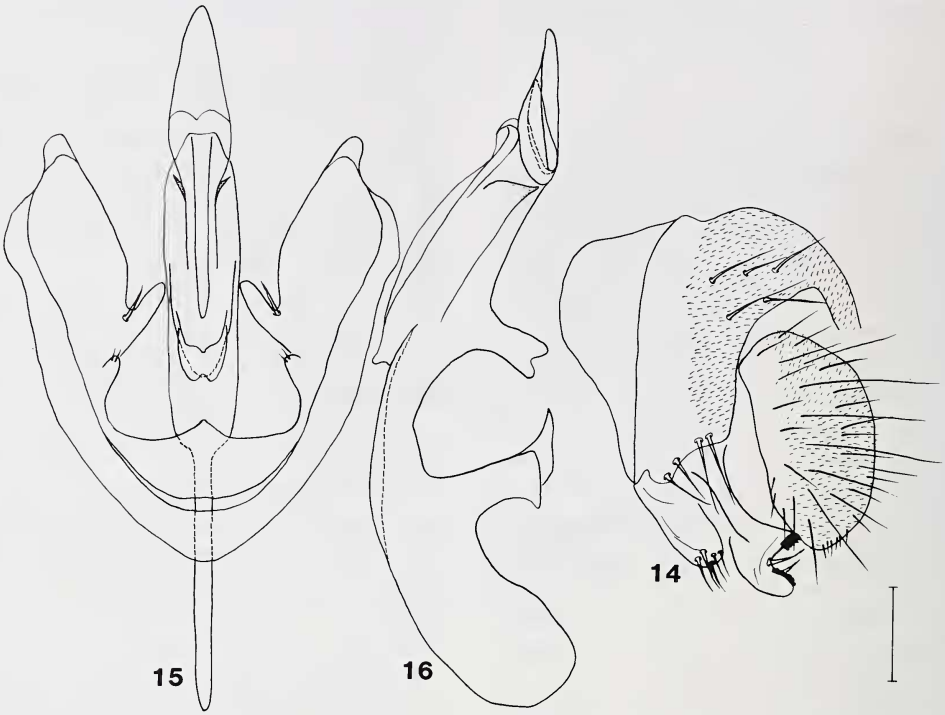
Distribution. China: Yunnan.

Relationships. This species somewhat resembles the foregoing species, *D. ruberrimoides*, in the morphology of aedeagus and epandrium, but differs from the latter in hypandrial process and surstylus.

Drosophila* (*Drosophila*) *parustulata sp. nov.
(Figs. 14–16)

♂. Body *ca.* 3.5–4.0 mm in length.

Head: Eye tannish red, with thick pile. Second joint of antenna yellow, with 2 stout setae; 3rd joint yellowish. Arista with 7 dorsal, 5 ventral branches and small terminal fork. Palpus yellow, with *ca.* 3 or 4 long stout bristles and a few hairs. Ocellar triangle yellowish red, with a few small hairs; ocellars long. Periorbit yellow. Frons yellowish red. Clypeus medially yellow, laterally brown. Frons *ca.* 1/2 as broad as head, with a few frontal hairs. Face yellow. Carina high, wider in lower part. Cheek yellow, *ca.* 1/7 as broad as greatest diameter of eye. Posterior reclinate orbital nearer to proclinate orbital than to inner vertical. Anterior reclinate orbital *ca.* 1/3 length of posterior reclinate; proclinate *ca.* 2/3 length of posterior reclinate. Vibrissa and 2nd oral long and



FIGS. 14–16. *Drosophila* (*Drosophila*) *parustulata* sp. nov. 14: Periphallic organs. 15: Phallic organs (ventral view). 16: Aedeagus (lateral view). Scale-line=0.1 mm.

stout, 2nd oral *ca.* 3/4 length of vibrissa; other orals short and thin.

Thorax: Mesoscutum and scutellum yellowish red. Thoracic pleura yellow. Humerals 2, subequal. Acrostichal hairs in 8 rows. Anterior dorsocentral *ca.* 5/7 length of posterior; cross distance of dorsocentrals *ca.* 2.4 length distance. Anterior scutellars convergent, *ca.* 3/4 length of posterior; posteriors convergent and crossed. Sterno-index *ca.* 0.65.

Legs yellow. Fore femur with row of *ca.* 13–14 spinules. Preapicals on all tibiae; apicals on mid tibia. ♂ fore tarsus without thick hair. Mid and hind tarsi each with row of minute cuneiform bristles on underside. Fore metatarsus as long as 3 succeeding tarsal joints together; mid and hind metatarsi as long as rest together.

Wing hyaline. Veins brownish yellow; anterior cross vein clear; posterior cross vein cloud; R_{4+5} and M nearly parallel. C_1-bristle 1. Wing indices: C *ca.* 4.9, 4C *ca.* 0.4, 4V *ca.* 1.1, 5x *ca.* 0.5, Ac *ca.* 1.4, C3F *ca.* 5/9. Haltere yellowish.

Abdomen: Tergites yellow; 2nd to 5th tergites each with narrow, caudal dark brown band.

Periphallic organs (Fig. 14): Epandrium pubescent dorsocaudally, with *ca.* 6 bristles in upper part and *ca.* 4 at base of surstylus, ventrally narrow and with *ca.* 5 short bristles. Surstylus deeply concave on distal margin, with *ca.* 5 teeth on upper distal margin, *ca.* 7 smaller teeth on lower distal margin and 2 long bristles. Cercus pubescent, with many bristles and tuft of several short bristles at caudoventral corner.

Phallic organs (Figs. 15 and 16): Aedeagus distally membranous and expanded like trumpet, laterally with 1 pair of acute, sclerotized projections, medioventrally with apically bifid, flattened appendage. Hypandrial process narrow. Novasternum large, V-shaped, with 1 pair of submedian spines near bases of hypandrial processes. Anterior parameres attached to lateral corners of novasternum, apically with 2 sensilla.

Holotype ♂, China: Meng-men, Meng-la County, Yunnan Province, 1.X.1985 (W. X.

Zhang).

Distribution. China: Yunnan.

Relationships. This species somewhat resembles *D. ustulata* Takada, Momma et Shima, 1973 in the shape of phallic organs, but differs from the latter in having hypandrial process, aedeagus laterally with 1 pair of acute sclerotized projections and medioventrally with an appendage, and surstylus with different arrangement of primary teeth.

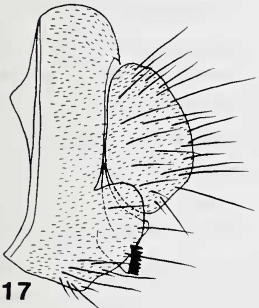
D. QUADRILINEATA SPECIES-SUBGROUP

Drosophila (Drosophila) nullilineata sp. nov. (Figs. 17–20)

♂, ♀. Body length ♂ *ca.* 2.5–3.0 mm. ♀ *ca.* 3.0–3.5 mm.

Head: Eye tannish red, with thin pile. Second joint of antenna yellow, with 2 stout setae; 3rd joint yellowish. Arista with 5 dorsal, 2 ventral branches and moderate terminal fork. Palpus yellow, with 2 long stout bristles apically and subapically and a few hairs. Ocellar triangle yellow, brownish on inner margins of ocelli, with a few small hairs; ocellars long. Periorbit yellow. Frons yellowish red, with a few hairs in anterior part. Clypeus brownish. Frons *ca.* 1/2 as broad as head width. Face yellow. Carina high and narrow. Cheek yellow, *ca.* 1/6–1/7 as broad as greatest diameter of eye. Posterior reclinate orbital nearer to proclinate orbital than to inner vertical. Anterior reclinate orbital *ca.* 1/2 length of posterior reclinate; proclinate *ca.* 4/7 length of posterior reclinate. Vibrissa long, stout and black; 2nd oral *ca.* 1/2 length of vibrissa.

Thorax: Mesoscutum entirely yellow without stripes. Scutellum yellow. Thoracic pleura yellow with 2 brownish longitudinal stripes; upper one from upper part of propleurite to base of haltere; lower one running through nearly entire length of sternoepisternum. Acrostichal hairs in 6 rows. Anterior dorsocentral *ca.* 5/8 length of posterior; cross distance of dorsocentrals *ca.* 1.8–1.9 length distance. Anterior scutellars divergent, posteriors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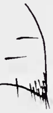
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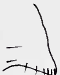
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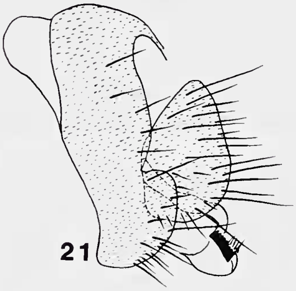
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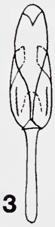
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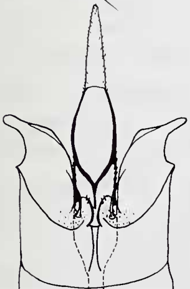
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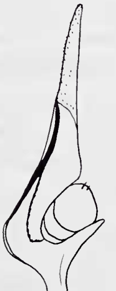
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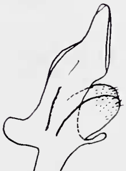
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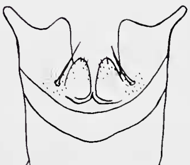
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Figs. 17–20. *Drosophila* (*Drosophila*) *nullilineata* sp. nov. 17: Periphallic organs. 18: Caudoventral apex of cercus. 19: Phallic organs (ventral view). 20: Aedeagus (lateral view). Scale-line=0.1 mm.

Figs. 21–25. *Drosophila* (*Drosophila*) *flavimedifemur* sp. nov. 21: Periphallic organs. 22: Caudoventral apex of cercus. 23: Aedeagus (ventral view). 24: Ditto (lateral view). 25: Novasternum. (Scale-line=0.1 mm.

convergent and crossed; anterior *ca.* 1.2 length of posterior. Sterno-index *ca.* 0.7.

Legs yellow. Fore coxa brownish in proximal part and inner margin. Fore femur with row of *ca.* 9–10 spinules. Preapicals on all tibiae; apicals on fore and mid tibiae. Fore metatarsus as long as 3 succeeding tarsal joints together; mid and hind metatarsi as long as rest together. Mid and hind tarsi without row of minute cuneiform bristles.

Wing hyaline. Veins yellow; anterior and posterior cross veins clear; R_{4+5} and M slightly convergent; R_{2+3} slightly curved to costa at tip. C_1-bristles 2, upper one larger. Wing indices: in ♂ C *ca.* 3.6, 4C *ca.* 0.7, 4V *ca.* 1.8, 5x *ca.* 1.75, Ac *ca.* 3.0, C3F *ca.* 1/3; in ♀ C *ca.* 4.4, 4C *ca.* 0.6, 4V *ca.* 1.7, 5x *ca.* 1.6, Ac *ca.* 2.4. Haltere yellowish.

Abdomen: Tergites yellow; 2nd to 5th tergites each with medially interrupted, laterally narrowing, dark brown caudal band and 1 pair of spots on lateral margins.

Periphallic organs (Figs. 17 and 18): Epandrium entirely pubescent, broad especially in subapical part, with *ca.* 12 bristles in middle to lower part. Surstylus with straight row of *ca.* 7 or 8 primary teeth on middle to lower distal margin; upper half strongly convex and bare. Cercus oval, pubescent, separate from epandrium, with many long bristles and *ca.* 5 short bristles at caudoventral apex (Fig. 18).

Phallic organs (Figs. 19 and 20): Aedeagus slender, longer than apodeme, apically tapering, transparent and with small spines, serrate on ventrosubmedial margins. Anterior paramere broad, oval in lateral view, separate from novasternum, with *ca.* 2 sensilla. Posterior paramere absent. Novasternum quadrate, pubescent around bases of 1 pair of submedian spines.

Holotype ♂, China: Shang-yong, Meng-la County, Yunnan Province, 27.IX.1985 (W. X. Zhang).

Allotype ♀, same data as holotype.

Distribution. China: Yunnan.

Relationships. This species certainly belongs to the *D. quadrilineata* species-subgroup because of having genitalia characteristic to this species-subgroup, but is unique in having mesoscutum without longitudinal stripes.

Drosophila (Drosophila) flavimedifemur sp. nov. (Figs. 21–25)

♂. Body *ca.* 4.0–4.5 mm in length.

Head: Eye tannish red, with thick pile. Second joint of antenna brown, with 2 stout setae; 3rd joint paler. Arista with 4 or 5 dorsal, 2 ventral branches and moderate terminal fork. Palpus apically brownish, basally yellow, with 1 long stout bristle at tip, 1 in subapical part and a few hairs. Ocellar triangle yellow, black on inner margins of ocelli, with a few small hairs; ocellars long. Periorbit yellow. Frons yellow with 2 anteriorly convergent brown stripes, with a few frontal hairs on anterior part of stripes. Clypeus brown. Frons *ca.* 1/2 as broad as head width. Face yellow. Carina high, not so wide, brown in lower part. Cheek yellow, brown at base of vibrissa, *ca.* 1/6 as broad as greatest diameter of eye. Posterior reclinate orbital nearer to proclinate orbital than to inner vertical. Anterior reclinate orbital *ca.* 2/3 length of posterior reclinate; proclinate *ca.* 7/9 length of posterior reclinate. Vibrissa long, stout and black; 2nd oral *ca.* 1/2 length of vibrissa.

Thorax: Mesoscutum yellow, with 7 brown longitudinal stripes; medial stripe wider, including 2 rows of acrostichal hairs, and running through nearly entire length of mesoscutum; inner pair of stripes starting slightly posteriorly, running along line of dorsocentrals, and continuing to stripes on scutellum; middle pair paler, from transverse suture to base of inner postalar; outer pair from anterolateral corner just above humerus to base of outer postalar, interrupted at transverse suture. Scutellum yellow, with 1 pair of brown longitudinal, posteriorly convergent stripes. Thoracic pleura yellow, with 3 brown longitudinal stripes; upper one short, from upper part of episternum to base of wing; middle one broad, long from upper part of propleurite to base of haltere; lower one broad, running through nearly entire length of sternoepisternum. Humerals 2, upper one longer. Acrostichal hairs in 6 rows. Dorsocentrals 2 pairs; anterior *ca.* 3/5 length of posterior; cross distance of dorsocentrals *ca.* 2.0 length distance. Anterior scutellar slightly longer than posterior; anteriors parallel, posteriors crossed. Sterno-index *ca.* 0.5.

Legs yellow. Fore coxa brown in proximal part;

mid and hind coxae partly brown. Fore femur brown on outside; mid femur yellow; hind femur slightly brownish on outside. Fore femur with row of *ca.* 11 stout spinules. Preapicals on all tibiae; apicals on fore and mid tibiae. Fore metatarsus as long as 3 succeeding tarsal joints together; mid and hind metatarsi slightly shorter than rest together. Mid and hind tarsi without row of minute cuneiform bristles.

Wing hyaline. Veins brownish yellow; anterior cross vein clear; posterior cross vein slightly cloud; R_{4+5} and M nearly parallel. C_1-bristles 2, subequal. Wing indices; C *ca.* 4.4, 4C *ca.* 0.5, 4V *ca.* 1.35, 5x *ca.* 1.2, Ac *ca.* 2.1, C3F *ca.* 1/4. Haltere milky white, with dark brown stalk.

Abdomen: Tergites yellow; 1st tergite with medially uninterrupted, dark brown caudal band and 1 pair of dark brown spots on lateral margins; 2nd to 6th tergites each with medially interrupted, dark brown caudal band and 1 pair of spots on lateral margins; lateral spots sometimes fused to caudal band.

Periphallic organs (Figs. 21 and 22): Epandrium pubescent, broad especially in subapical part, with *ca.* 17 bristles. Surstylus broad, with straight row of *ca.* 9 primary teeth on submedial margin and a few small setae on inner surface; upper and lower apical part bare. Cercus oval, pubescent, separate from epandrium, with many long bristles and *ca.* 10 short bristles at caudoventral apex (Fig. 22).

Phallic organs (Figs. 23–25): Aedeagus slender, apically not so round in ventral view, serrate on ventrosubmedial margins. Anterior paramere broad, oval in lateral view, fused to novasternum, apically pubescent and with *ca.* 3 sensilla. Posterior paramere absent. Novasternum quadrate, submedially pubescent, with 1 pair of submedian spines on inner margins.

Holotype ♂, China: Kunming, Yunnan Province, 21.II.1987 (M. J. Toda).

Distribution. China: Yunnan.

Relationships. This species is similar to *D. flavitibiae* or *D. clarinervis* Toda, 1986 in the coloration of body, but distinguished from the latters in having entirely yellow mid femur, short mid sternopleural and different structure of ♂ genitalia.

ACKNOWLEDGMENT

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Larval Stages of *Coenobita purpureus* Stimpson and *C. cavipes* Stimpson Reared in the Laboratory and Survival Rates and Growth Factors of Three Land Hermit Crab Larvae (Crustacea: Anomura)

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ABSTRACT—The complete larval development of *Coenobita purpureus* and the glaucothoe of *C. cavipes* are described and illustrated based on larvae reared in the laboratory. *C. purpureus* has five zoeal and one glaucothoe stages. It seems very likely that the first zoea of *C. rugosus* described by Yamaguchi belongs to *C. purpureus*. The mean points of 50% survivorship of starved larvae of *C. purpureus*, *C. rugosus* and *C. cavipes* at a seawater temperature of 28 ± 0.9°C were about day 8, 11 and 7, respectively and none of them molted to the next stage; those of fed larvae were about day 19, 19, 16, respectively. The duration of the fourth stage was shortened in *C. rugosus* and *C. purpureus*. The greatest growth occurred between the second and third zoeal stages in *C. purpureus* and *C. rugosus*, between the fourth and fifth stages in *C. cavipes*. The first glaucothoes of *C. rugosus*, *C. purpureus* and *C. cavipes* emerged on the 16th, 17th and 25th days of their larval life, respectively. After the appearance of glaucothoes, survival rates of the larvae rapidly declined due to both predation of the fifth zoeae by the glaucothoes and cannibalism of the glaucothoes. The death during the molt to glaucothoes also was another factor that lowered the survival rates. Some glaucothoes of *C. purpureus* entered shells on the 10th day after their appearance.

INTRODUCTION

Borradaile [1] first pointed out that the youngs of *Coenobita rugosus* and *C. perlatus* hatch as zoeal larvae which are released in the sea. He [2] illustrated the first zoea of *C. perlatus*. The first zoea and glaucothoe of *C. rugosus* were described and illustrated by Yamaguchi [3] who studied the reproductive ecology of this species in Kikaijima Island of the Amami Islands. Provenzano [4] was the first to report on the complete larval development in *Coenobita*, describing and illustrating in detail the larval development of *C. clypeatus*. Recently, Shokita and Yamashiro [5] described and illustrated the larval development of *C. rugosus* and the zoeal stages of *C. cavipes*.

It is known that some land hermit crabs and the coconut crab of the family Coenobitidae pass through five zoeal and one glaucothoe stages in the larval development [4–6]. The shell use of glaucothoe has also been observed [4, 6, 7]. The mean total growth and mean incremental growth factors of zoeae have been calculated on the basis of the larvae of two species [8]. However, the survival rates of zoeal larvae under fed and starved conditions are little known for any species of the family.

During my current studies on the ecology and distribution of land hermit crabs in Okinawa Prefecture, Japan, I had an opportunity of studying the larval development and survival rates of *C. purpureus*, *C. rugosus* and *C. cavipes* under laboratory conditions. In the present paper, the complete larval development of *C. purpureus* and the glaucothoe stage of *C. cavipes* are described, and the larval survival rates and growth factors of the three species are noted.

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MATERIALS AND METHODS

One ovigerous female of *C. cavipes* was collected from Hyakuna, southern Okinawa, at night on 6 July, that of *C. purpureus* from the same place on 21 July and *C. rugosus* from the same place on 5 August, 1986. They released the larvae shortly after being placed in a plastic bucket containing sea water.

Three groups each of 50 zoeae of each species were reared in plastic bowls each containing 1.2 liters of filtered, moderately aerated sea water. Newly-hatched *Artemia* nauplii were given as food daily and the larvae were transferred to fresh filtered sea water every four or five days. Water temperature was 28±0.9°C. The larvae of each stage were preserved in 5% seawater-formalin. Dissection was done in glycerin. The total and carapace lengths of the larvae were measured before dissection using an ocular micrometer. Total length was measured from the rostral tip to the posteromedial end of the telson exclusive of setae. Carapace length was measured from the rostral tip to the posteromedial end of the carapace. Drawings were made with the aid of an ocular micrometer. Three or four larvae of each stage were examined for confirmation of zoeal characters.

To compare survival rates of larvae of *C. rugosus*, *C. purpureus* and *C. cavipes*, 6 groups each of 50 zoeae of each species were reared in bowls. For feeding and starvation experiments, 3 of the 6 bowls were given *Artemia* nauplii and the other 3 were not. Each bowl was examined daily for live and dead larvae, which were confirmed under binocular stereomicroscope.

RESULTS

Coenobita rugosus, *C. purpureus* and *C. cavipes* passed through five zoeal and one glaucothoe stages, but the glaucothoes all died without molting to the first crab stage. For zoeal stages of *C. cavipes* and complete larval stages of *C. rugosus*, the reader is referred to Shokita and Yamashiro [5]. The duration of zoeal and glaucothoe stages and the sizes of larvae of these three species are summarized in Figure 10 and Table 1.

Description of zoeal stages of *C. purpureus*

First zoea

Carapace (Fig. 1, A): Long pointed rostrum

Table 1. Comparison of total and carapace lengths (mean±SD) in each stage zoea and glaucothoe of three species of *Coenobita*

Species		Size of each stage zoea and glaucothoe (mm)					
		I	II	III	IV	V	G
Coenobita purpureus	TL*	2.70 ±0.03 (n=5)	3.27 ±0.11 (n=4)	4.20 ±0.14 (n=5)	4.57 ±0.05 (n=4)	5.15 ±0.13 (n=5)	4.28 ±0.04 (n=5)
	CL**	1.16 ±0.04 (n=5)	1.39 ±0.04 (n=4)	1.91 ±0.08 (n=5)	2.26 ±0.02 (n=4)	2.34 ±0.09 (n=5)	1.50 ±0.04 (n=5)
Coenobita rugosus	TL	2.59 ±0.04 (n=5)	3.10 ±0.15 (n=5)	4.23 ±0.07 (n=5)	4.48 ±0.19 (n=5)	4.85 ±0.08 (n=5)	4.00 ±0.02 (n=5)
	CL	1.16 ±0.03 (n=5)	1.45 ±0.07 (n=5)	1.91 ±0.06 (n=5)	2.02 ±0.05 (n=5)	2.16 ±0.10 (n=5)	1.37 ±0.07 (n=5)
Coenobita cavipes	TL	2.26 ±0.04 (n=5)	2.68 ±0.05 (n=5)	3.25 ±0.05 (n=4)	3.78 ±0.14 (n=5)	5.13 ±0.15 (n=4)	4.33 ±0.21 (n=4)
	CL	1.00 ±0.02 (n=5)	1.19 ±0.08 (n=5)	1.41 ±0.04 (n=4)	1.67 ±0.08 (n=5)	2.31 ±0.10 (n=4)	1.39 ±0.11 (n=4)

*) Total length from rostral tip to posterior margin of telson.

**) Carapace length from rostral tip to posteromedial end of carapace.

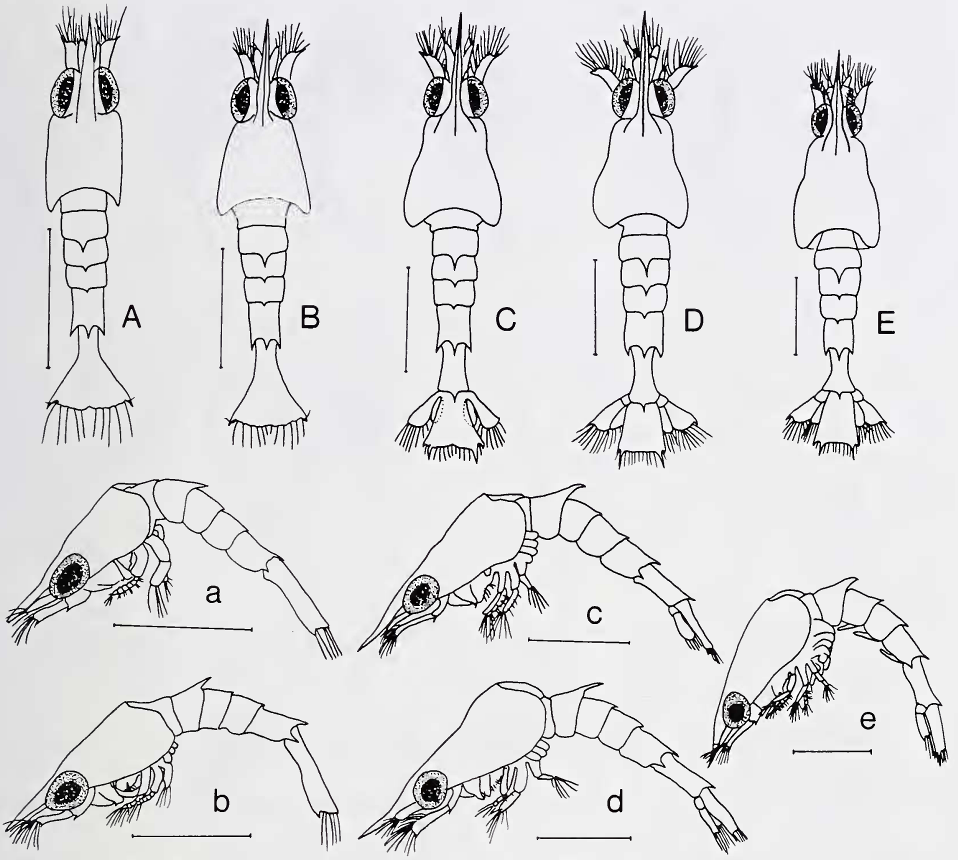

FIG. 1. *Coenobita purpureus*. First (A, a) to fifth (E, e) zoeae. Upper, dorsal view (A–E); lower, lateral view (a–e). Scales show 1.0 mm.

extending beyond tip of antennal scales. Rostrum and carapace smooth. Eyes sessile.

Antennule (Fig. 2, A): Unsegmented, terminally provided with 3 aesthetascs (one of them short) and 3 plumose setae (one of them long), subterminally with 1 long plumose seta.

Antenna (Fig. 2, F): Biramous; unsegmented endopod fused with protopod, bearing 3 terminal plumose setae. Antennal scale distolaterally produced into sharp spine, provided with 10 plumose setae on distal and mesial margins, one of them short, directly inner to distolateral spine, and with fine setules on inner margin. Protopod provided with 1 setiferous spine subterminally.

Mandible: No observation.

Maxillule (Fig. 3, A): Three-segmented endopod with 2 terminal setae. Basal endite with 2 strong denticulate spines and 2 short simple setae. Coxal endite with 5 long plumose and 2 short simple setae.

Maxilla (Fig. 3, F): Endopod unsegmented, bearing 3 terminal and 2 subterminal setae. Proximal lobe of basal endite with 5 setae and distal lobe with 3 setae. Proximal lobe of coxal endite with 7 setae and distal lobe with 4 setae. Scaphognathite incomplete, posterior lobe absent, anterior lobe with 4 plumose setae.

First maxilliped (Fig. 4, A): Basis provided with 1 hook-like process proximally, setal formula progressing distally 2, 3, 2. Exopod with 4 natatory setae. Endopod five-segmented, setal formula progressing distally 2–2–3–2–5; second to fourth segments with some setules.

Second maxilliped (Fig. 4, F): Basis with 2 setae. Exopod with 4 natatory setae. Endopod four-segmented, setal formula progressing distally